

Flora Malesiana: Orchids of New Guinea Vol. VI

Genus *Bulbophyllum*



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Hortus
botanicus
LEIDEN

NCB **naturalis**



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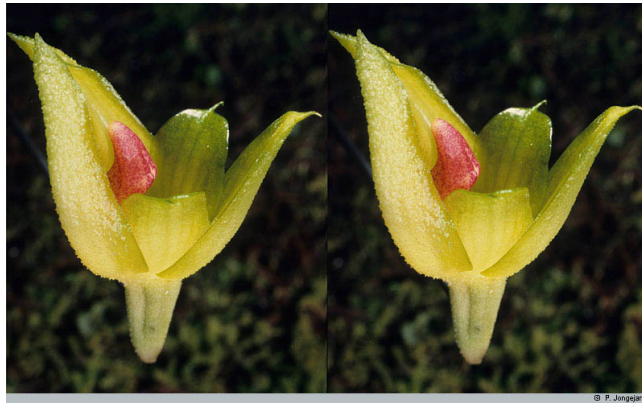
Peter Schalk & Gideon Gijswijt.

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Introduction

This CD-ROM, the final volume in the series, treats the mega-genus *Bulbophyllum*. Two genera that clearly belong to *Bulbophyllum*, namely *Pedilochilus* and *Saccoglossum*, are provisionally maintained here pending the formal transfer of the species concerned. Some 635 species are treated in detail. For each species a full description is given, with data on distribution (including maps), synonymy, cultivation, ecology, typification, classification, etc. In excess of 2500 color photographs and drawings add to the value of this CD-ROM. A special feature, as compared to prior volumes, is the about 1000 stereo and stereo-macro images made by Peter Jongejan. These offer amazing 3D views of some of the most intricate flowers in the Plant Kingdom. Several leading botanical institutes, such as the Royal Botanic Gardens, Kew, the Royal Botanic Garden, Edinburgh, the Herbarium Bogoriense, Bogor, and the National Capital Botanic Garden, Port Moresby, as well as many well-known photographers have contributed to make this CD-ROM a must for everyone interested in the orchids of New Guinea and Southeast Asia.



ETI BioInformatics: sharing knowledge

Sharing of information, and truly global collaboration, is imperative to generate the knowledge needed to underpin sensible and realistic policies for a responsible use of the Earth's natural resources. ETI BioInformatics is an NGO in operational relation with UNESCO, dedicated to developing innovative ICT tools and custom-built informatics services that facilitate access to biodiversity data, enable interoperability between databases and information services, and support common access portals. ETI cooperates with biodiversity specialists and scientific institutes around the world to make data accessible and interoperable. ETI services and partnerships are presented on our Web site.

To facilitate data sharing and exchange ETI has developed the Linnaeus II data management system for biodiversity information. It consists of three modules: the Linnaeus II 'builder': to create taxonomic information/identification systems; Linnaeus II 'runtime': to publish completed biodiversity information systems on CD-ROM/DVD-ROM; and the Linnaeus II 'Web publisher': to publish and use these information systems on the Internet. Scientists may download the Linnaeus II builder free of cost from the ETI Web site: <http://www.eti.uva.nl/products/linnaeus.php>

ETI provides the scientific community with an e-publishing service for electronic monographs in Linnaeus II format. These are published as part of the World Biodiversity Database and made available either online, on compact disk, or both. Other quality biodiversity databases or information systems may also be published by ETI.

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The United Nations Educational, Scientific and Cultural Organization (UNESCO)

The United Nations Educational, Scientific and Cultural Organization (UNESCO) promotes international cooperation in education, science, culture, and communication. Taxonomy and related ecological studies have been amongst the sciences fostered over past decades.

Concern about the erosion of the world's taxonomic heritage led UNESCO in the 1980s to encourage and support the establishment of the Expert Center for Taxonomic Identification (ETI) at the University of Amsterdam. ETI's biodiversity database and advanced electronic distribution technology are expected to help address global, regional, and local biological diversity issues. This requires an interactive and easily accessible flow of information, involving expert data providers and users in all regions of the world. ETI stimulates the international cooperation of scientists and the free exchange of scientific data.

ETI's educational and scientific DVD-ROMs and CD-ROMs, such as the *Orchids of New Guinea Vol. VI*, will facilitate distribution of scientific knowledge worldwide, including developing countries, and will thereby enhance awareness and capacity building.

www.unesco.org

Installation

Serial number

During installation you will be asked to enter your name and serial number. The serial number can be found on the CD tray, which is visible when you remove the disc from its jewel case. Please enter this number exactly as printed on the sticker, making sure to observe upper and lower case. Important: store the serial number safely, because you cannot reinstall the CD-ROM without it.

Important

Under Windows this CD-ROM can be installed in the Program Files folder only if you have full administrative privileges. Users with a Limited User or Guest account will be able to install the program in the Program Files folder if they have access to an administrator password.

Installation for Windows XP

1. Place the CD-ROM 'Flora Malesiana: Orchids of New Guinea Vol. VI' in the CD-ROM player of your computer.
2. Click on the Start button in the menu bar (usually located near the bottom of the screen).
3. Select Settings
4. Select Control Panels from the list now shown.
5. Select and open Add or Remove Programs.
6. Click on the Add New Programs option on the left hand side of the Add or Remove Programs window.
7. Click the CD or Floppy button in the window that appears next.
8. Click on the Next button in the Install Program from diskette or CD-ROM window that has now opened.
9. You are now in the Run Installation Program window. The installation program for the 'Flora Malesiana: Orchids of New Guinea Vol. VI' is found on the CD-ROM. Click on Finish to start the installation.

Installation for Windows Vista and Windows 7

1. Place the CD-ROM 'Flora Malesiana: Orchids of New Guinea Vol. VI' in the CD-player of your computer.
2. In the Autoplay window, choose "Open folder to view files".
3. The window of the CD-ROM is now opened.
4. In this window, double-click the file Setup.exe.
5. The setup program of 'Flora Malesiana: Orchids of New Guinea Vol. VI' will start. Follow the on-screen instructions from here.

Hint

Another way to install the program is by opening the CD-ROM and double clicking on the icon Setup.exe. On some computers the three-letter extension (.exe) will not be shown automatically. In such cases the application is represented by an icon depicting a blue computer with some diskettes and a small box in front of it.

How to start the program

1. Click on the Start button in the menu bar (usually located near the bottom of the screen).
2. Select All Programs from the list now shown.
3. Select ETI from the subsequent list now shown.
4. Select 'Flora Malesiana: Orchids of New Guinea Vol. VI' and click once on this item.

Deleting the program

1. Click on the Start button in the menu bar (usually located near the bottom of the screen) and select Programs from the list now shown.
2. Select ETI from the subsequent list now shown.
3. Select 'Uninstall Flora Malesiana: Orchids of New Guinea Vol. VI' and click once on this item.

About *Bulbophyllum*

There is no doubt that *Bulbophyllum* is the most species-rich and morphologically the most diverse orchid genus in New Guinea. At present we know some 635 provisionally accepted species from this island. Since every trip, even to relatively thoroughly-collected areas, brings back new species, we can safely predict that there must be well over 800 species in this genus in New Guinea alone. The genus as a whole is pantropic, with outliers in South Africa, Japan and New Zealand, and may ultimately be found to contain more than 2000 species. This makes it the biggest of all orchid genera.

Attempts to split up this gargantuan genus into smaller, more manageable units have generally faltered due to the fact that most of the main groups differ only in rather loose combinations of characters. In every section there are species that do not possess all the diagnostic characters of that section, and yet seem to belong in it; conversely, species that seemingly belong to a certain group based on its diagnostic characters sometimes show other characters that contradict the affinity.

Such genera as *Cirrhopetalum*, *Pedilochilus*, *Saccoglossum*, *Monosepalum*, and others, have been split off, but molecular studies (Gravendeel, pers. comm.) clearly indicate that these 'genera' are deeply nested within *Bulbophyllum*. To recognise these genera would imply that many other, much less distinct groups, would have to be treated as separate genera as well. Even specialists would often find it difficult to identify those genera. We therefore consider it preferable to maintain only a single genus for the whole alliance, and to use a classification based on sections to come to terms with its diversity. This has the great advantage that at least the genus name will always be easy to determine.

Since for almost all species of *Pedilochilus* and *Saccoglossum* there is as yet no name available within *Bulbophyllum*, we have decided to list for those two genera all the species under their traditional genus names, with the understanding that they should eventually be accommodated in *Bulbophyllum*. Especially in the case of *Pedilochilus* this requires a thorough study of the taxonomy of its member species, in order not to create a lot of superfluous names. Of the species of the former genus *Codonosiphon* only one is still listed as such; this too should, if it proves to be distinct, eventually be transferred to *Bulbophyllum*. Under *Monosepalum* we have listed two species; a third is here included as *Bulbophyllum muricatum*.

The sectional classification used here is a work in progress by Jaap Vermeulen, who has struggled for the best part of his professional life with this genus. Since some of the results are still tentative, they are deliberately presented in a somewhat informal way in order not to anticipate a more formal publication, which is in preparation.

Rudolf Schlechter was the first to establish a useful sectional classification of *Bulbophyllum* in his great work on the orchids of New Guinea (Schlechter 1911-1914). However, he rarely described the sections in a systematic way, and probably relied mainly on his, admittedly phenomenal, intuition. Many of the sections he recognised are undoubtedly natural groups, others are clearly artificial. Another problem is that the names Schlechter adopted, or coined, for his sections do not always have priority. As a result, many of the names used by Schlechter have to be replaced. For example, *Polyblepharon* has to be called *Monanthes*; *Leptopus* is now *Polymeres* (and includes several other Schlechterian sections, such as *Fruticicola* and *Rhizocaulon*); *Coelochilus* has become *Codonosiphon*, etc. The revised classification can be found in the Higher Taxa module on this CD-ROM.

Eventually, in conjunction with molecular work, a stable and workable system should arise. However, this should not distract us from admiring the individual species for their strangeness, complexity and beauty. Some *Bulbophyllum* species possess flowers that almost seem to transcend the concept of flower, and yet, as almost all flowers do, they have to attract pollinators. It is still one of the big gaps in our knowledge that we know very little about the functional aspects of the floral morphology of most *Bulbophyllum* species. Surely, all those hairs, moveable lips, and baroque appendages are there for a reason. There is still room for exciting new discoveries in this field; about this there can be no doubt.

A novel feature of this CD-ROM, compared to its five predecessors in the series, is the inclusion of stereo-images, almost all made by Peter Jongejan. Before he retired from his hobby of collecting and photographing *Bulbophyllum* species about two decades ago, he assembled what was probably the best collection of *Bulbophyllum* species there has ever been. With permission from the authorities there, Mr. Jongejan made several collecting trips to Papua New Guinea. These have contributed enormously to our knowledge of the genus *Bulbophyllum*, and they have yielded numerous new species, all of which, as far as they have been described already, are shown on this CD-ROM, using Mr. Jongejan's own stereo-slides. His slides are now in the collection of the Royal Botanic Gardens, Kew, and we are fortunate that we are allowed to reproduce many of them here.

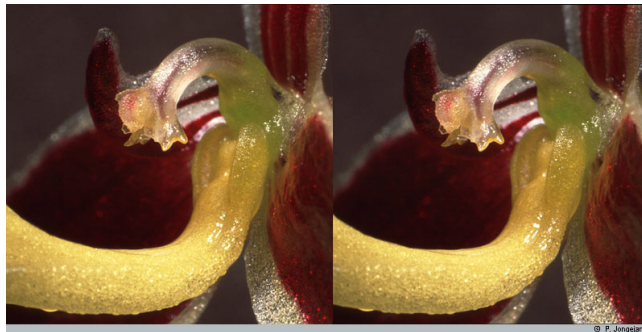
We are, as before, indebted to the Cheng Kim Loke Foundation, Singapore;

the Pacific Biological Foundation (<http://apscience.org.au>);

and

Conservation International (<http://www.conservation.org>),

for vital financial support.



Linnaeus II modules

This CD-ROM was built using the software Linnaeus II, developed by ETI BioInformatics at the University of Amsterdam in the Netherlands. The information is structured into modules to facilitate fast access to and easy handling of the data.

Navigator

The Navigator module is the first window you see after you start the program. It is the “command center” from which you can access any part of the system. Click on the icons to open the various sections.



Introduction

The Introduction contains three parts: a general introduction to this CD-ROM, a guide to identification, as well as a chapter on cultivation.



Text Key

The Text Key is a classic identification tool, using a sequence of choices between two alternatives to guide the user to the right taxon. The program creates a decision path of the choices made, making it easy to go back and reconsider difficult choices.



Index

The Index lists all the taxa in the Higher Taxa and Species modules, including synonyms, as an easy means of accessing information on a particular taxon. Not only the full taxon names, but also the specific epithets are included in the index.



Species

The Species module contains information on all 654 species and taxa at lower rank (varieties, formae, subspecies) of *Bulbophyllum* (as well as *Codonosiphon*, *Monosepalum*, *Pedilochilus* and *Saccoglossum*). This information includes descriptions, synonyms, distribution, types, author and place of first publication, distribution maps, and, most important, usually a link to one or several images. As this is not a taxonomic revision but a critical synopsis, it must be understood that many ‘species’ in this module will undoubtedly prove to be synonyms once the whole genus is thoroughly studied. A brief indication of (presumed) cultural requirements is given for the great majority of species. See also the chapter on cultivation in the Introduction.



Higher taxa

The Higher Taxa module contains information on the sections of *Bulbophyllum*. For each there is a description with general notes, a list of synonyms, an indication of its taxonomic position, where relevant a list of references to revisions and monographs, and a collection of images selected to show the diversity of the group. Quite a few of these images have not been identified to species-level, several may in fact represent as yet undescribed species.



Glossary

The Glossary is a hyperlinked and richly illustrated list with definitions of over 560 more or less technical terms. Not all of these are used in the texts on the current CD-ROM, but they may be found in the literature cited or in other CD-ROMs in this series.



Literature

The Literature module contains references to the most important general sources on New Guinea Orchids. Additional references are provided in the Species and Higher Taxa modules.

Help

An online user manual has been built into this CD-ROM. Comprehensive instructions and tips on key features such as finding text, alternative ways of navigating through the contents of the CD-ROM (using the Contents, Bookmarks, or Recent options), and using the Notepad can be accessed from the Help menu. You can also use the Find function to locate information on a particular topic in the Help module.

General Instructions Loreo Lite 3D Viewer

1. This viewer supplied with the CD-ROM may be used with or without eyeglasses. If you are severely long or short sighted it is recommended that you keep your glasses on.
2. The viewing panel still bulges a little in brand new viewers, but settles in well after being erected and used.
3. If you use bifocals please view the images through the upper part of your eyeglasses, not the lower part, which is for reading. Viewing the pictures appears to be a close-up task, but viewing 3D images through this viewer will not work well if you use the reading lenses.
4. Screen resolution should be such that the complete stereo image on screen is less than 25 cm (10") wide.



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